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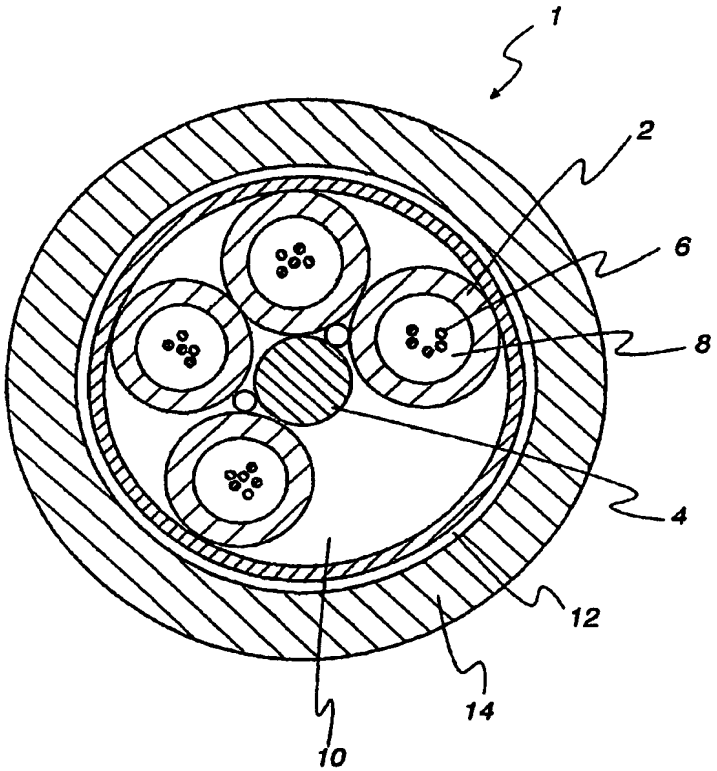
*[Continued on next page]*

(54) Title: OPTICAL CABLE COMPONENTS




(57) Abstract: This invention is directed to optical cable components fabricated from an extrudable blend of high crystalline polypropylene and an impact modifying polymer to provide an enhanced balance flexural modulus, Izod notched value, grease resistance, and low shrinkage properties. The polypropylene has a crystallinity of greater than 56 weight percent and a melt flow of from 1 to 20 grams per 10 minutes at 230 degree C. At 23 degrees C, the composition yields an extrudant having a 1-percent secant modulus of at least 1,600 MPa and a notched Izod of at least 35 J/m. The composition also yields an extruded tube having a shrinkage of less than 2.0 percent after 24 hours at 100 degrees C. One example of the impact modifying polymer is an ethylene/1-octene polyethylene copolymer.

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# INTERNATIONAL SEARCH REPORT

ıational Application No
ı/US 03/31708

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 G02B6/44 C08L23/14 C08L23/12

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 G02B C08L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
WPI Data, PAJ, EPO-Internal, INSPEC

C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category ° | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|---|---|---|
| X | STRICKER: "m-PP Blends: Processing and Properties of Blends Based on m-PP and Ethylene Copolymers" KUNSTSTOFFE PLAST EUROPA, 1998, pages 17-19, XP009028138 | 1,3,4,6 |
| Y | the whole document | 2,5 |
| X | PREMPHET ET AL: "polypropylene/metallocene ethylene-octene copolymer blends with a bimodal particle size distribution: mechanical properties and their controlling factors" JOURNAL OF APPLIED POLYMER SCIENCE, vol. 85, 2002, pages 2412-2418, XP002275412 | 1,3,4,6 |
| Y | the whole document | 2,5 |

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[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

° Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

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"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

| Date of the actual completion of the international search | Date of mailing of the international search report |
|---|---|
| 11 May 2004 | 03/06/2004 |

| Name and mailing address of the ISA | Authorized officer |
|---|---|
| European Patent Office, P.B. 5818 Patentlaan 2<br>NL - 2280 HV Rijswijk<br>Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,<br>Fax: (+31-70) 340-3016 | Anderson, C |

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

| Category ° | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|---|---|---|
| X | SILVA DA A L N ET AL: "RHEOLOGICAL AND THERMAL PROPERTIES OF BINARY BLENDS OF POLYPROPYLENE AND POLY(ETHYLENE-CO-1-OCTENE)" , JOURNAL OF APPLIED POLYMER SCIENCE, JOHN WILEY AND SONS INC. NEW YORK, US, VOL. 79, NR. 9, PAGE(S) 1634-1639 XP001180329 ISSN: 0021-8995 the whole document | 1,3,4,6 |
| X | MCKENNAGHAN: "Ethylene-1-octene Polyolefin Elastomers" KGK KAUTSCUK GUMMI KUNSTSTOFFE, vol. 54, no. 10, 2001, pages 540-545, XP000118033 the whole document | 1,3,4,6 |
| X | KONTOPOULOU M ET AL: "Effect of composition and comonomer type on the rheology, morphology and properties of ethylene-alpha-olefin copolymer/polypropylene blends" , POLYMER, ELSEVIER SCIENCE PUBLISHERS B.V, GB, VOL. 44, NR. 24, PAGE(S) 7495-7504 XP004467317 ISSN: 0032-3861 the whole document | 1,3,4,6 |
| Y | EP 1 085 358 A (LUCENT TECHNOLOGIES INC) 21 March 2001 (2001-03-21) paragraphs '0051!,'0052!,'0068! | 2,5 |
| Y | EP 1 191 375 A (CIT ALCATEL) 27 March 2002 (2002-03-27) paragraph '0002! paragraph '0022! - paragraph '0029! | 5 |
| A | MCNALLY T ET AL: "Rheology, phase morphology, mechanical, impact and thermal properties of polypropylene/metallocene catalysed ethylene 1-octene copolymer blends" , POLYMER, ELSEVIER SCIENCE PUBLISHERS B.V, GB, VOL. 43, NR. 13, PAGE(S) 3785-3793 XP004349550 ISSN: 0032-3861 the whole document | 1-6 |
| A | LING ZHANG ET AL.: "Fibrillar Morphology of Elastomer-Modified Polypropylene: Effect of Interface Adhesion and Processing Conditions" JOURNAL OF APPLIED POLYMER SCIENCE, vol. 86, 2002, pages 2085-2092, XP002275411 the whole document | 1-6 |

# INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 03/31708

## Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☒ Claims Nos.: –
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:

see FURTHER INFORMATION sheet PCT/ISA/210

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

**Remark on Protest**

☐ The additional search fees were accompanied by the applicant's protest.

☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box I.2

Claims 1, 5 and 6 describe an extruded blend of a crystalline polypropylene and "an impact modifier" in amounts, "effective for providing the extruded component with a 1 -percent secant modulus at 23 degrees C of at least about 1,600 MPa and a Notched Izod at 23 degrees C of at least about 35 J/m"

These features are considered to render claims 1, 5 and 6 so unclear in the meaning of Art. 6 PCT as to render a meaningful search of the subject matter of claim 1 impossible for the following reasons (see also PCT Gazette - Section IV, III 4.7):

(i) The 1-percent secant modulus at 23 degrees is not an accepted parameter in the art. The person skilled in the art would thus not know how to perform a measurement to obtain this parameter;

(ii) The Notched Izod is not a standard normalised measurement with repeatable results. The person skilled in the art would thus not be able to compare his mixture with that of the claims.

(iii) The applicant does provide in the description a list of polymers which could, among others be used as the "impact modifying polymer" of claim 1, however ANY polymer would modify the impact parameters of polypropylene to some extent. Thus in determining which blends have the necessary features to carry out the invention as claimed, the person skilled in the art would have to perform these tests on all blends of polypropylene blended with at least every polymer given in the description but also every other known polymer in varying amounts. This work is not considered to fall under the term of, "nothing more than trial and error".

Consequently the search has been carried out for those parts of the claims which appear to be clear, supported and disclosed, namely for the blends given in examples 1-5 given on pages 11-14 of the description.

The applicant's attention is drawn to the fact that claims, or parts of claims, relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure.

# INTERNATIONAL SEARCH REPORT

[redacted]mation on patent family members

[redacted]ational Application No
[redacted]US 03/31708

| Patent document cited in search report | Publication date | Patent family member(s) | Publication date |
|---|---|---|---|
| EP 1085358 A | 21-03-2001 | US 6404962 B1 | 11-06-2002 |
| | | EP 1085358 A2 | 21-03-2001 |
| | | JP 2001124965 A | 11-05-2001 |
| | | US 2002076179 A1 | 20-06-2002 |
| EP 1191375 A | 27-03-2002 | FR 2814245 A1 | 22-03-2002 |
| | | CN 1344948 A | 17-04-2002 |
| | | EP 1191375 A2 | 27-03-2002 |
| | | EP 1191376 A1 | 27-03-2002 |
| | | JP 2002107589 A | 10-04-2002 |
| | | US 2002034367 A1 | 21-03-2002 |
| | | US 2002034366 A1 | 21-03-2002 |